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# COLLENIA FREQUENS IN UPPER PROTEROZOIC ROCKS IN THE NORTHERN TERRITORY OF AUSTRALIA.

By D. M. TRAVES.

(Communicated by Dr. Germaine A. Joplin.)

(Plate vi; one Text-figure.)

[Read 28th July, 1954.]

## Synopsis.

Specimens of a Pre-Cambrian alga were collected from two localities in the north-western part of the Northern Territory in 1952. These specimens closely resemble the form *Collenia frequens* described by Walcott, and Fenton and Fenton, from the Belt Series of North America.

*Cryptozoan frequens* was first described in 1906 by C. D. Walcott. In 1914 he transferred the species *frequens* into the genus *Collenia*. Fenton and Fenton in 1931, 1933 and 1937 described specimens of *Collenia frequens* Walcott from the Belt Series of Upper Proterozoic sediments of North America.



Text-fig. 1.—Locality map.

The Australian specimens attributed here to *C. frequens* Walcott were collected from two localities in the north-western part of the Northern Territory in 1952. At both localities small outcrops of silicified Upper Proterozoic rocks form inliers in the Antrim Plateau Volcanics of Lower Cambrian age. The first locality is at Top Spring at the junction of the Montejinni and Murrenji Tracks and the second locality is seven miles west of Catfish Yard, south of Wave Hill Station.

*Description.*

The colonies are elongate-conical with each colony consisting of conical laminae from 1 to 2 mm. apart, which are grouped into layers of 3-15 mm. The apices of the laminae are rounded and most specimens have a hole or tube through the axis of the cone. This is well illustrated in Plate vi, figure 1.

Most specimens have a similar taper with an apical angle of approximately  $50^\circ$  and a ratio of the diameter to the length of the cone of approximately 1.1. However two specimens have a different taper with apical angles of approximately  $30^\circ$  and a ratio of .5.

Diameters range from less than 2.5 cm. (1 inch) to greater than 61 cm. (2 feet). In most cases the outside laminae spread over other colonies.

At both localities the colonies have formed a bioherm which has been surrounded by the Antrim Plateau Volcanics. The inliers are completely silicified and, in places, rock crystal has grown within the structures.

*Remarks.*

The Australian specimens of *C. frequens* compare well with the description given by Fenton and Fenton (1937) and the specimens shown in their plate 15 bear a striking resemblance to the one in Plate vi, figure 3. However, they do not mention the presence of an axial tube, which is a prominent feature of the specimens from the two Northern Territory localities. This tube may have been filled or hidden by different modes of preservation, but it would be interesting to re-examine the specimens from the Belt Series of North America to see if a central tube did exist. Also no apical angles of the cones were given and, as specimens of two different angles were found in the Northern Territory, the complete range of taper is not known.

Plate vi, figure 4 shows the rounded apical end of *C. frequens* which easily distinguishes it from the cone-in-cone structure found in some sediments.

Although *C. frequens* is the nearest described form it is well to remember that in the case of Proterozoic algae the general opinion is that each form may be built up of several species of algae. However, forms may still be used for stratigraphical correlation and sub-division.

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## EXPLANATION OF PLATE VI.

1. *C. frequens* on top of bioherm at Top Spring, N.T.—2. *C. frequens* on side of bioherm at Top Spring, N.T.—3. Section of *C. frequens*.  $\times \frac{3}{8}$ .—4. *C. frequens*, showing rounded apical end.  $\times \frac{3}{8}$ .

## AUSTRALIAN FUNGI.

## II. NEW RECORDS AND REVISIONS.

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(Two Text-figures.)

[Read 28th July, 1954.]

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*Synopsis.*

One hundred fungi are dealt with in this paper; some represent new species, others new records for Australia or for parts thereof, and notes are included on a number of species previously recorded here.

This paper deals with a number of Australian Fungi sent to me from various Herbaria here, and by a number of collectors in different parts of the continent. The origin of each collection is detailed below, and I have to thank the authorities and collectors concerned for their most valuable assistance in endeavours to revise the Fungus Flora of Australia. I can only hope that the present paper will stimulate other collectors to more activity in this field. The numbering of the species is continued from the first paper of this series, published in these PROCEEDINGS, 78:51-82, September 1953.

## PHYCOMYCETES.

(62) *CYSTOPUS CENTAURII* Hansf., n. sp.

Sori conidiiferi foliicoli et cauliculi, albi, ovoidei vel rotundati, subinde confluentes et elongati, usque ad 1.5 mm. longi, primo epidermide inflato tecti, demum illo disrupto subnudenti, pulverulenti. Conidiophora erecta, hyalina,  $20-40 \times 12-18\mu$ , stipata, simplicia. Conidia acrogena, catenulata, globosa vel subcuboidea, hyalina, levia, continua,  $18-26\mu$  diam., interdum membrana intus annulato-incrassata. Oogonia in mesophyllo et in cortice caulis dispersa, globosa vel ovoidea, usque ad  $70 \times 50\mu$ ; oosporae singulae, ex fulvo brunnescentes postremo subopacae, globosae,  $50-60\mu$  diam., plerumque grosse uni-guttulatae; episporio  $5-6\mu$  cr., dense reticulato-sulcato.

Hab. in foliis *Centaurei spicati*, The Chalet, Kosciusko, New South Wales, A. Costin 59.

The conidial sori occur on leaves, less commonly on the stems, and are white and pulverulent when mature, surrounded by the broken epidermis, up to 1.5 mm. long on the stems when confluent, covered at first by the inflated epidermis. The conidiophores form a close palisade at the base of the sorus, and are erect, simple, hyaline, continuous,  $20-40 \times 12-18\mu$ , forming simple chains of spores at the apex, without interstitial cells. The young spores are globose, but soon become almost cuboid from mutual pressure, and are hyaline, smooth, continuous,  $18-26\mu$  diam., sometimes showing an indistinct internal transverse annular thickening of the wall. The oogonia occur in the leaf mesophyll and also in the cortical tissue of the stem, being loosely scattered, globose to ovoid, thin-walled, up to  $70 \times 50\mu$ ; each contains a single oospore, which is at first pale yellowish, but soon darkens first to brown and finally to almost opaque black-brown. Mature oospores are globose,  $50-60\mu$  diam., usually containing a single large oil globule; the episporio is  $5-6\mu$  thick and closely reticulate with furrows descending  $3-4\mu$  into the wall.

This is close to *C. swertiae* (Berl. & Rom.) Sacc., as given in Syll. Fung. 21:858, 1912, but the Australian species differs in its larger conidia and oospores.

## ASCOMYCETES.

(63) *ELSINOE TRISTANIAE* Hansf., n. sp.

Maculae epiphyllae, usque ad 70 mm. diam., rufobrunneae, concentrice indistincte zonatae, zona lutea 5 mm. cr. circumdatae. Mycelium in mesophyllo ex hyphis hyalinis,

ramosis, septatis, 1.5–3 $\mu$  cr. compositum, sub cuticula folii pseudoparenchymatice aggregatum et laminam continuam usque ad 30 $\mu$  cr. efformans. Conidiophora dense fasciculata, erumpentia, erecta, simplicia, hyalina, continua, 10–25  $\times$  1.5–2 $\mu$ . Conidia singula, acrogena, hyalina, continua, ovata, levia, circa 3  $\times$  1.5 $\mu$ . Asci in stroma subcuticulari irregulariter dispersi, singuli vel laxe gregarii, globosi vel ovati, sessiles, 8-sporei, circa 35 $\mu$  diam., paraphysati. Sporae hyalinae, conglobatae, muriformes, transverse 7-septatae, in medio leniter constrictae, leves, 20–25  $\times$  10–11 $\mu$ .

Hab. in foliis *Tristaniae confertae*, Chatswood, New South Wales, July 1935, L. Fraser; Murwillumbah, Fraser, Feb. 1951.

Leafspots epiphyllous, up to 70 mm. diam., becoming red to brown in the centre, with a yellow-buff border about 5 mm. wide, somewhat concentrically zonate; sometimes producing an indefinite brown discoloration on the lower side of the leaf. The mycelium penetrates the mesophyll as fine, branched, hyaline, septate hyphae 1.5–3 $\mu$  thick, intercellular and without haustoria in the host cells. A complete sheet of closely interwoven similar hyphae, up to 30 $\mu$  in depth, is formed between the upper epidermis and cuticle, the latter being raised and broken in places by the tufts of conidiophores formed above this subcuticular stroma; viewed from the surface the raised pattern of the cuticle shows as irregularly reticulate lines 50–100 $\mu$  wide. The conidiophores are densely fasciculate, forming a palisade covering the somewhat thickened mycelial stroma, erect, unbranched, 10–25  $\times$  1.5–2 $\mu$ , hyaline, continuous, forming single conidia at the apex. Conidia not adherent in chains, hyaline, ovate, continuous, smooth, thin-walled, about 3  $\times$  1.5 $\mu$ .

The asci are scattered irregularly throughout the subcuticular stroma beneath the layer of conidiophores, usually single, but sometimes in loose groups separated by mycelial hyphae, globose to ovate, thin-walled, sessile, 8-spored, about 35 $\mu$  diam.; at maturity each elongates through the stroma towards the surface, when the free apex discharges the spores. Paraphyses none. Spores conglobate in the ascus, hyaline, slipper-shaped, with usually 7 transverse and 1–2 longitudinal septa, constricted at the middle septum, the upper half slightly wider than the lower, smooth, 20–25  $\times$  10–11 $\mu$ , rather strongly refractive.

(64) *ELSINOE EUCALYPTI* Hansf., n. sp.

Maculae amphigenae, irregulares, leniter ruguloso-elevatae, atrobrunneae, in centro griseo-brunneae, acute limitatae, usque ad 10 mm. diam., vel confluentes. Mycelium ex hyphis hyalinis, ramosis, septatis, intercellularibus compositum, mesophyllum totum folii penetrantibus et sub epidermide in stromam plectenchymaticam aggregatis usque ad 90 $\mu$  cr., demum erumpente et conidiifera. Conidiophora dense stipata, erecta, simplicia, continua, hyalina, usque ad 20 $\mu$  longa; conidia singula, acrogena, hyalina, ovata, continua, levia, 4–6  $\times$  3–4 $\mu$ . Asci primo in greges minutos laxos immersos evoluti, globosi, demum late ellipsoidei, sessiles, usque ad 45  $\times$  28 $\mu$ , apice incrassati (5–6 $\mu$ ), 8-sporei. Sporae conglobatae vel multiseriatae, hyalinae, clavulato-ellipsoideae utrinque rotundatae, 20–26  $\times$  7–8 $\mu$ , transverse 3- et longitudinaliter 1-septatae, in medio leniter constrictae, leves, refringentes.

Hab. in foliis *Eucalypti* sp. indet., Rocky River, Kangaroo Is., South Australia, Feb. 1920, WARI 2010,\* leg. T. Osborn.

Leafspots amphigenous, irregularly rounded and elevated, rugulose, sharply defined, dark brown with greyish-brown centre, up to 10 mm. diam. or confluent, showing through the leaf on the opposite side as a smooth, dark brown, somewhat raised spot. The internal mycelium penetrates the whole mesophyll as intercellular hyaline septate, much branched hyphae, without haustoria, and aggregates beneath the epidermis to form a plectenchymic stroma up to 90 $\mu$  thick in places; the epidermis eventually ruptures irregularly and is shed to expose the surface of the stroma, which is then covered with a dense palisade of conidiophores. Conidiophores erect, simple, continuous, hyaline, forming conidia singly at the apex, up to 20 $\mu$  long by 2–3 $\mu$  thick. Conidia hyaline, ovate, smooth, continuous, 4–6  $\times$  3–4 $\mu$ . The asci are first formed in small loose groups within

\* WARI = Waite Agricultural Research Institute.